4

The Improbable World

Although it is clear that "social science" is a vigorous ally of Technopoly and must therefore be regarded with a hostile eye, I occasionally pay my respects to its bloated eminence by inflicting a small experiment on some of my colleagues. Like many other social-science experiments, this one is based on deceit and exploitation, and I must rely on the reader's sense of whimsy to allow its point to come through.

The experiment is best conducted in the morning when I see a colleague who appears not to be in possession of a copy of *The New York Times.* "Did you read the *Times* this morning?" I ask. If my colleague says, "Yes," there is no experiment that day. But if the answer is "No," the experiment can proceed. "You ought to check out Section C today," I say. "There's a fascinating article about a study done at the University of Minnesota." "Really? What's it about?" is the usual reply. The choices at this point are almost endless, but there are two that produce rich results. The first: "Well, they did this study to find out what foods are best to eat for losing weight, and it turns out

that a normal diet supplemented by chocolate eclairs eaten three times a day is the best approach. It seems that there's some special nutrient in the eclairs—encomial dyoxin—that actually uses up calories at an incredible rate."

The second changes the theme and, from the start, the university: "The neurophysiologists at Johns Hopkins have uncovered a connection between jogging and reduced intelligence. They tested more than twelve hundred people over a period of five years, and found that as the number of hours people jogged increased there was a statistically significant decrease in their intelligence. They don't know exactly why, but there it is."

My role in the experiment, of course, is to report something quite ridiculous—one might say, beyond belief. If I play my role with a sense of decorum and collegial intimacy, I can achieve results worth reporting: about two-thirds of the victims will believe or at least not wholly *disbelieve* what I have told them. Sometimes they say, "Really? Is that possible?" Sometimes they do a double-take and reply, *"Where'd* you say that study was done?" And sometimes they say, "You know, I've *heard* something like that." I should add that for reasons that are probably worth exploring I get the clearest cases of credulity when I use the University of Minnesota and Johns Hopkins as my sources of authority; Stanford and MIT give only fair results.

There are several conclusions that might be drawn from these results, one of which was expressed by H. L. Mencken fifty years ago, when he said that there is no idea so stupid that you can't find a professor who will believe it. This is more an accusation than an explanation, although there is probably something to it. (I have, however, tried this experiment on nonprofessors as well, and get roughly the same results.) Another possible conclusion was expressed by George Bernard Shaw, also about fifty years ago, when he wrote that the average person today is about as credulous as was the average

person in the Middle Ages. In the Middle Ages, people believed in the authority of their religion, no matter what. Today, we believe in the authority of our science, no matter what.

However, there is still another possibility, related to Shaw's point but off at a right angle to it. It is, in any case, more relevant to understanding the sustaining power of Technopoly. I mean that the world we live in is very nearly incomprehensible to most of us. There is almost no fact, whether actual or imagined, that will surprise us for very long, since we have no comprehensive and consistent picture of the world that would make the fact appear as an unacceptable contradiction. We believe because there is no reason not to believe. And I assume that the reader does not need the evidence of my comic excursion into the suburbs of social science to recognize this. Abetted by a form of education that in itself has been emptied of any coherent world-view, Technopoly deprives us of the social, political, historical, metaphysical, logical, or spiritual bases for knowing what is beyond belief.

That is especially the case with technical facts. Since this book is filled with a variety of facts, I would hardly wish to shake confidence in them by trying my experiment on the reader. But if I informed you that the paper on which this book is printed was made by a special process which uses the skin of a pickled herring, on what grounds would you dispute me? For all you know—indeed, for all *I* know—the skin of a pickled herring could have made this paper. And if the facts were confirmed by an industrial chemist who described to us some incomprehensible process by which it was done (employing, of course, encomial dyoxin), we might both believe it. Or not wholly disbelieve it, since the ways of technology, like the ways of God, are awesome and mysterious.

Perhaps I can get a bit closer to the point with an analogy. If you open a brand-new deck of cards and start turning the cards over, one by one, you can get a pretty firm idea of what

their order is. After you have gone from the ace of spades through to the nine of spades, you expect a ten of spades to come up next. And if the three of diamonds appears, you are surprised and wonder what kind of deck of cards this is. But if I give you a deck that had been shuffled twenty times and then ask you to turn the cards over, you do not expect any card in particular—a three of diamonds would be just as likely as a ten of spades. Having no expectation of a pattern, no basis for assuming a given order, you have no reason to react with incredulity or even surprise to whatever card turns up.

The belief system of a tool-using culture is rather like a brand-new deck of cards. Whether it is a culture of technological simplicity or sophistication, there always exists a more or less comprehensive, ordered world-view, resting on a set of metaphysical or theological assumptions. Ordinary men and women might not clearly grasp how the harsh realities of their lives fit into the grand and benevolent design of the universe, but they have no doubt that there *is* such a design, and their priests and shamans are well able, by deduction from a handful of principles, to make it, if not wholly rational, at least coherent. The medieval period was a particularly clear example of this point. How comforting it must have been to have a priest explain the meaning of the death of a loved one, of an accident, or of a piece of good fortune. To live in a world in which there were no random events—in which everything was, in theory, comprehensible; in which every act of nature was infused with meaning—is an irreplaceable gift of theology. The role of the church in premodern Europe was to keep the deck of cards in reasonable order, which is why Cardinal Bellarmine and other prelates tried to prevent Galileo from shuffling the deck. As we know, they could not, and with the emergence of technocracies moral and intellectual coherence began to unravel.

What was being lost was not immediately apparent. The decline of the great narrative of the Bible, which had provided

answers to both fundamental and practical questions, was accompanied by the rise of the great narrative of Progress. The faith of those who believed in Progress was based on the assumption that one could discern a purpose to the human enterprise, even without the theological scaffolding that supported the Christian edifice of belief. Science and technology were the chief instruments of Progress, and in their accumulation of reliable information about nature they would bring ignorance, superstition, and suffering to an end. As it turned out, technocracies did not disappoint Progress. In sanitation, pharmacology, transportation, production, and communication, spectacular improvements were made possible by a Niagara of information generated by just such institutions as Francis Bacon had imagined. Technocracy was fueled by information—about the structure of nature as well as the structure of the human soul.

But the genie that came out of the bottle proclaiming that information was the new god of culture was a deceiver. It solved the problem of information scarcity, the disadvantages of which were obvious. But it gave no warning about the dangers of information glut, the disadvantages of which were not seen so clearly. The long-range result—information chaos—has produced a culture somewhat like the shuffled deck of cards I referred to. And what is strange is that so few have noticed, or if they have noticed fail to recognize the source of their distress. You need only ask yourself, What is the problem in the Middle East, or South Africa, or Northern Ireland? Is it lack of information that keeps these conflicts at fever pitch? Is it lack of information about how to grow food that keeps millions at starvation levels? Is it lack of information that brings soaring crime rates and physical decay to our cities? Is it lack of information that leads to high divorce rates and keeps the beds of mental institutions filled to overflowing?

The fact is, there are very few political, social, and especially personal problems that arise because of insufficient information.

Nonetheless, as incomprehensible problems mount, as the concept of progress fades, as meaning itself becomes suspect, the Technopolist stands firm in believing that what the world needs is yet more information. It is like the joke about the man who complains that the food he is being served in a restaurant is inedible and also that the portions are too small. But, of course, what we are dealing with here is no joke. Attend any conference on telecommunications or computer technology, and you will be attending a celebration of innovative machinery that generates, stores, and distributes more information, more conveniently, at greater speeds than ever before. To the question "What problem does the information solve?" the answer is usually "How to generate, store, and distribute more information, more conveniently, at greater speeds than ever before." This is the elevation of information to a metaphysical status: information as both the means and end of human creativity. In Technopoly, we are driven to fill our lives with the quest to "access" information. For what purpose or with what limitations, it is not for us to ask; and we are not accustomed to asking, since the problem is unprecedented. The world has never before been confronted with information glut and has hardly had time to reflect on its consequences.

As with so many of the features of all that is modern, the origins of information glut can be traced many centuries back. Nothing could be more misleading than the claim that computer technology introduced the age of information. The printing press began that age in the early sixteenth century.[1] Forty years after Gutenberg converted an old wine press into a printing machine with movable type, there were presses in 110 cities in six different countries. Fifty years after the press was invented, more than eight million books had been printed, almost all of them filled with information that had previously been unavailable to the average person. There were books on law, agriculture, politics, exploration, metallurgy, botany, linguistics,

pediatrics, and even good manners. There were also assorted guides and manuals; the world of commerce rapidly became a world of printed paper through the widespread use of contracts, deeds, promissory notes, and maps. (Not surprisingly, in a culture in which information was becoming standardized and repeatable, mapmakers began to exclude "paradise" from their charts on the grounds that its location was too uncertain.)

So much new information, of so many diverse types, was generated that printers could no longer use the scribal manuscript as their model of a book. By the mid-sixteenth century, printers began to experiment with new formats, among the most important innovations being the use of Arabic numerals to number pages. (The first known example of such pagination is Johann Froben's first edition of Erasmus' New Testament, printed in 1516.) Pagination led inevitably to more accurate indexing, annotation, and cross-referencing, which in turn was accompanied by innovations in punctuation marks, section heads, paragraphing, title-paging, and running heads. By the end of the sixteenth century, the machine-made book had a typographic form and a look comparable to books of today.

All of this is worth mentioning because innovations in the format of the machine-made book were an attempt to control the flow of information, to organize it by establishing priorities and by giving it sequence. Very early on, it was understood that the printed book had created an information crisis and that something needed to be done to maintain a measure of control. The altered form of the book was one means. Another was the modern school, which took shape in the seventeenth century. In 1480, before the information explosion, there were thirty-four schools in all of England. By 1660, there were 444, one school for every twelve square miles. There were several reasons for the rapid growth of the common school, but none was more obvious than that it was a necessary response to the anxieties and confusion aroused by information on the loose. The invention of what is called a curriculum was a logical step toward organizing, limiting, and discriminating among available sources of information. Schools became technocracy's first secular bureaucracies, structures for legitimizing some parts of the flow of information and discrediting other parts. Schools were, in short, a means of governing the ecology of information.

With the rise of technocracies, information became a more serious problem than ever, and several methods of controlling information had to be invented. For a richly detailed account of what those methods were, I refer the reader to James Beniger's *The Control Revolution*, which is among the three or four most important books we have on the subject of the relation of information to culture. In the next chapter, I have relied to a considerable degree on *The Control Revolution* in my discussion of the breakdown of the control mechanisms, but here I must note that most of the methods by which technocracies have hoped to keep information from running amok are now dysfunctional.

Indeed, one way of defining a Technopoly is to say that its information immune system is inoperable. Technopoly is a form of cultural AIDS, which I here use as an acronym for Anti-Information Deficiency Syndrome. This is why it is possible to say almost anything without contradiction provided you begin your utterance with the words "A study has shown . . ." or "Scientists now tell us that . . ." More important, it is why in a Technopoly there can be no transcendent sense of purpose or meaning, no cultural coherence. Information is dangerous when it has no place to go, when there is no theory to which it applies, no pattern in which it fits, when there is no higher purpose that it serves. Alfred North Whitehead called such information "inert," but that metaphor is too passive. Information without regulation can be lethal. It is necessary, then, to describe briefly the technological conditions that led to such a grim state of affairs.

If the telescope was the eye that gave access to a world of new facts and new methods of obtaining them, then the printing press was the larynx. The press not only created new sources of data collection but vastly increased communication among scientists on a continent-wide basis. The movement toward standardization of scientific discourse resulted, for example, in uniform mathematical symbols, including the replacement of Roman with Arabic numerals. Galileo's and Kepler's reference to mathematics as the language or alphabet of nature could be made with assurance that other scientists could speak and understand that language. Standardization largely eliminated ambiguity in texts and reduced error in diagrams, charts, and visual aids. Printing brought an end to the alchemists' secrets by making science into a public enterprise. And not only for scientists: printing led to the popularization of scientific ideas through the use of vernaculars. Although some scientists—Harvey, for example—insisted on writing in Latin, many others (Bacon, of course) eagerly employed the vernacular in an effort to convey the new spirit and methods of scientific philosophy. When we consider that Vesalius, Brahe, Bacon, Galileo, Kepler, Harvey, and Descartes were all born in the sixteenth century, we can begin to grasp the relationship between the growth of science and the printing press, which is to say, the press announced the advent of science, publicized it, encouraged it, and codified it.

As is known, the press did the same for what is now called Protestantism. Martin Luther's reliance on printed pamphlets and books as a means of religious propaganda is well documented, as is his own acknowledgment of the importance of print to his mission. And yet, for all of Luther's astuteness about printing, even he was surprised on occasion by the unsuspected powers of the press. "It is a mystery to me," he wrote in a letter to the Pope, "how my theses . . . were spread to so many places. They were meant exclusively for our academic circle here. . . . They were written in such a language that the common people could hardly understand them." What Luther overlooked was the sheer *portability* of printed books. Although his theses were written in academic Latin, they were easily transported throughout Germany and other countries by printers who just as easily had them translated into vernaculars.

Without going any further into the details of the impact of print on medieval thought, all of which are lucidly presented in Elizabeth Eisenstein's *The Printing Press as an Agent of Change*, I will instead merely assert the obvious point: By the beginning of the seventeenth century, an entirely new information environment had been created by print. Astronomy, anatomy, and physics were accessible to anyone who could read. New forms of literature, such as the novel and personal essays, were available. Vernacular Bibles turned the Word of God into the words of God, since God became an Englishman or a German or a Frenchman, depending on the language in which His words were revealed. Practical knowledge about machines, agriculture, and medicine was widely dispersed. Commercial documents gave new form and vigorous impetus to entrepreneurial adventures. And, of course, printing vastly enhanced the importance of individuality.

Vitalized by such an information explosion, Western culture set itself upon a course which made technocracies possible. And then something quite unexpected happened; in a word, nothing. From the early seventeenth century, when Western culture undertook to reorganize itself to accommodate the printing press, until the mid-nineteenth century, no significant technologies were introduced that altered the *form*, *volume*, or *speed* of information. As a consequence, Western culture had more than two hundred years to accustom itself to the new information conditions created by the press. It developed new institutions, such as the school and representative government. It developed new conceptions of knowledge and intelligence, and a height-

ened respect for reason and privacy. It developed new forms of economic activity, such as mechanized production and corporate capitalism, and even gave articulate expression to the possibilities of a humane socialism. New forms of public discourse came into being through newspapers, pamphlets, broadsides, and books. It is no wonder that the eighteenth century gave us our standard of excellence in the use of reason, as exemplified in the work of Goethe, Voltaire, Diderot, Kant, Hume, Adam Smith, Edmund Burke, Vico, Edward Gibbon, and, of course, Jefferson, Madison, Franklin, Adams, Hamilton, and Thomas Paine. I weight the list with America's "Founding Fathers" because technocratic-typographic America was the first nation ever to be *argued* into existence *in print*. Paine's *Common Sense* and *The Rights of Man*, Jefferson's Declaration of Independence, and the *Federalist Papers* were written and printed efforts to make the American experiment appear reasonable to the people, which to the eighteenth-century mind was both necessary and sufficient. To any people whose politics were the politics of the printed page, as Tocqueville said of America, reason and printing were inseparable. We need not hesitate to claim that the First Amendment to the United States Constitution stands as a monument to the ideological biases of print. It says: "Congress shall make no law respecting the establishment of religion, or prohibiting the free exercise thereof; or abridging freedom of speech or of the press; or of the right of the people peaceably to assemble, and to petition the government for a redress of grievances." In these forty-five words we may find the fundamental values of the literate, reasoning mind as fostered by the print revolution: a belief in privacy, individuality, intellectual freedom, open criticism, and community action.

Equally important is that the words of that amendment presume and insist on a public that not only has access to information but has control over it, a people who know how to use

information in their own interests. There is not a single line written by Jefferson, Adams, Paine, Hamilton, or Franklin that does not take for granted that when information is made available to citizens they are capable of managing it. This is not to say that the Founding Fathers believed information could not be false, misleading, or irrelevant. But they believed that the marketplace of information and ideas was sufficiently ordered so that citizens could make sense of what they read and heard and, through reason, judge its usefulness to their lives. Jefferson's proposals for education, Paine's arguments for self-governance, Franklin's arrangements for community affairs assume coherent, commonly shared principles that allow us to debate such questions as: What are the responsibilities of citizens? What is the nature of education? What constitutes human progress? What are the limitations of social structures?

The presumed close connection among information, reason, and usefulness began to lose its legitimacy toward the mid-nineteenth century with the invention of the telegraph. Prior to the telegraph, information could be moved only as fast as a train could travel: about thirty-five miles per hour. Prior to the telegraph, information was sought as part of the process of understanding and solving particular problems. Prior to the telegraph, information tended to be of local interest. Telegraphy changed all of this, and instigated the second stage of the information revolution. The telegraph removed space as an inevitable constraint on the movement of information, and, for the first time, transportation and communication were disengaged from each other. In the United States, the telegraph erased state lines, collapsed regions, and, by wrapping the continent in an information grid, created the possibility of a unified nation-state. But more than this, telegraphy created the idea of context-free information—that is, the idea that the value of information need not be tied to any function it might serve in social and political

decision-making and action. The telegraph made information into a commodity, a "thing" that could be bought and sold irrespective of its uses or meaning.[2]

But it did not do so alone. The potential of the telegraph to transform information into a commodity might never have been realized except for its partnership with the penny press, which was the first institution to grasp the significance of the annihilation of space and the saleability of irrelevant information. In fact, the first known use of the telegraph by a newspaper occurred *one day* after Samuel Morse gave his historic demonstration of the telegraph's workability. Using the same Washington-to-Baltimore line Morse had constructed, the Baltimore *Patriot* gave its readers information about action taken by the House of Representatives on the Oregon issue. The paper concluded its report by noting, ". . . we are thus enabled to give our readers information from Washington up to two o'clock. This is indeed the annihilation of space." Within two years of this announcement, the fortunes of newspapers came to depend not on the quality or utility of the news they provided but on how much, from what distances, and at what speed.

And, one must add, with how many photographs. For, as it happened, photography was invented at approximately the same time as telegraphy, and initiated the third stage of the information revolution. Daniel Boorstin has called it "the graphic revolution," because the photograph and other iconographs brought on a massive intrusion of images into the symbolic environment: photographs, prints, posters, drawings, advertisements. The new imagery, with photography at its forefront, did not merely function as a supplement to language but tended to replace it as our dominant means for construing, understanding, and testing reality. By the end of the nineteenth century, advertisers and newspapermen had discovered that a picture was worth not only a thousand words but, in terms of sales, many thousands of dollars.

As the twentieth century began, the amount of information available through words and pictures grew exponentially. With telegraphy and photography leading the way, a new definition of information came into being. Here was information that rejected the necessity of interconnectedness, proceeded without context, argued for instancy against historical continuity, and offered fascination in place of complexity and coherence. And then, with Western culture gasping for breath, the fourth stage of the information revolution occurred, broadcasting. And then the fifth, computer technology. Each of these brought with it new forms of information, unprecedented amounts of it, and increased speeds (if virtual instancy can be increased).

What is our situation today? In the United States, we have 260,000 billboards; 11,520 newspapers; 11,556 periodicals; 27,000 video outlets for renting video tapes; more than 500 million radios; and more than 100 million computers. Ninety-eight percent of American homes have a television set; more than half our homes have more than one. There are 40,000 new book titles published every year (300,000 worldwide), and every day in America 41 million photographs are taken. And if this is not enough, more than 60 billion pieces of junk mail (thanks to computer technology) find their way into our mailboxes every year.

From millions of sources all over the globe, through every possible channel and medium—light waves, airwaves, ticker tapes, computer banks, telephone wires, television cables, satellites, printing presses—information pours in. Behind it, in every imaginable form of storage—on paper, on video and audio tape, on discs, film, and silicon chips—is an ever greater volume of information waiting to be retrieved. Like the Sorcerer's Apprentice, we are awash in information. And all the sorcerer has left us is a broom. Information has become a form of garbage, not only incapable of answering the most fundamental human questions but barely useful in providing coherent direction to the

solution of even mundane problems. To say it still another way: The milieu in which Technopoly flourishes is one in which the tie between information and human purpose has been severed, i.e., information appears indiscriminately, directed at no one in particular, in enormous volume and at high speeds, and disconnected from theory, meaning, or purpose.

All of this has called into being a new world. I have referred to it elsewhere as a peek-a-boo world, where now this event, now that, pops into view for a moment, then vanishes again. It is an improbable world. It is a world in which the idea of human progress, as Bacon expressed it, has been replaced by the idea of technological progress. The aim is not to reduce ignorance, superstition, and suffering but to accommodate ourselves to the requirements of new technologies. We tell ourselves, of course, that such accommodations will lead to a better life, but that is only the rhetorical residue of a vanishing technocracy. We are a culture consuming itself with information, and many of us do not even wonder how to control the process. We proceed under the assumption that information is our friend, believing that cultures may suffer grievously from a lack of information, which, of course, they do. It is only now beginning to be understood that cultures may also suffer grievously from information glut, information without meaning, information without control mechanisms.

5

The Broken Defenses

Technopoly is a state of culture. It is also a state of mind. It consists in the deification of technology, which means that the culture seeks its authorization in technology, finds its satisfactions in technology, and takes its orders from technology. This requires the development of a new kind of social order, and of necessity leads to the rapid dissolution of much that is associated with traditional beliefs. Those who feel most comfortable in Technopoly are those who are convinced that technical progress is humanity's supreme achievement and the instrument by which our most profound dilemmas may be solved. They also believe that information is an unmixed blessing, which through its continued and uncontrolled production and dissemination offers increased freedom, creativity, and peace of mind. The fact that information does none of these things—but quite the opposite—seems to change few opinions, for such unwavering beliefs are an inevitable product of the structure of Technopoly. In particular, Technopoly flourishes when the defenses against information break down.